EXHIBIT 5

FTOS Command Line Interface

FTOS CLI

Industry-standard CLI Syntax with Enhanced Manageability Features

Consistent Show, Configuration, Debugging and CLI Navigation Commands Across Switch/Router Product Lines

The Power of One: Consistency

FTOS, the Force10 Operating System, is the operating system that runs on Force10 switch/router product lines. Force10 delivers a single version of FTOS for all platforms that follows a linear, sequential release path. By delivering the same OS across its entire switch/router line, including the E-Series, C-Series and S-Series switch/router platforms, Force10 ensures that customers benefit from stable code, a consistent feature set and simpler software management.

- Common management functionality and a common user interface across the Force10 product line makes operating the network easier
- Streamlined product training and learning curve because system configuration, diagnostics, troubleshooting and software maintenance are identical across all platforms
- Support for the same CLI, SNMP and XML management models throughout the entire network greatly simplifies life-cycle management of the infrastructure
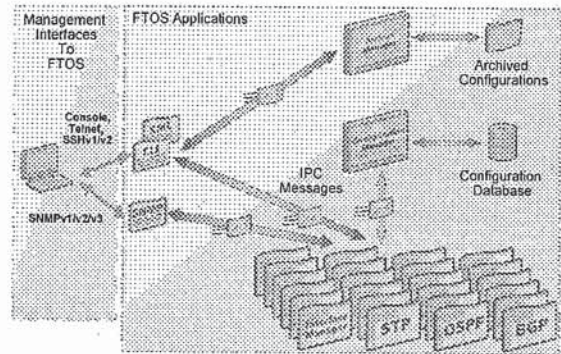

Figure 1. FTOS software architecture

FTOS: Not Your Father's CLI

The FTOS CLI combines an industry-standard show, configuration and debugging syntax with enhanced usability and navigation features. As a result, configuration and troubleshooting is just like working on an IOS platform, but more comfortable.

- CLI is accessible over the serial console, Telnet or SSHv1/v2 for interactive or automated management
- "terminal xml" command enables XML front end to CLI
- Support for common tools such as Expect and RANCID
- Integration of Unix-like features such as "grep" and "diff" for configuration management

The CLI is the primary method of managing an FTOS switch/router, and supports interactive or automated logins using CLI scripting. It is also responsible for communicating with the FTOS application processes over IPC for sending configuration information or requesting output for a show command.

Configurations can be archived by the archive manager, and used for automated configuration rollback to restore a known working configuration.

Figure 2. FTOS running on the E-Series, C-Series and S-Series switch/router platforms

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FTOS Command Line Interface

Force10 FTOS Features

- Identical CLI on all platforms
- Ranges and aliases for bulk configuration
- Line card preconfiguration
- Command history shows timestamp, users and CLI commands
- Configuration locking
- Configuration commit and rollback
- Online serviceability and diagnostics
- Full-featured "grep" and "no-more" pipe for all commands with unlimited pipes

- ACLs and routing policies with sequence numbers, remarks and "resequence" command
- "do" command in configuration mode
- "send" command to write all users (Unix write/wall functionality)
- "show configuration" context while in configuration mode
- "monitor interface" command
- "show run <context>" command
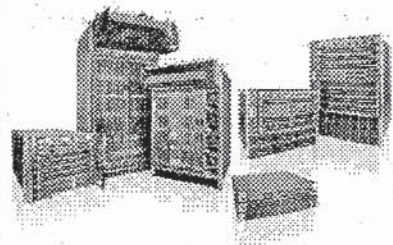- Configuration file "diff" command

Table 1. **Simplified operations through the FTOS CLI**

Specifications: FTOS CLI

IEEE Compliance

802.1AB	Link Layer Discovery Protocol
802.1D	Bridging, STP
802.1p	L2 Prioritization
802.1Q	VLAN Tagging, Double VLAN Tagging, GVRP
802.1s	Multiple Spanning Tree Protocol
802.1w	Rapid Spanning Tree Protocol
802.1X	Network Access Control
802.3ad	Link Aggregation with LACP
Cisco	Per-VLAN Spanning Tree+

RFC and I-D Compliance

General Internet Protocols

768	UDP
793	TCP
854	Telnet
959	FTP
1035	DNS (client)
1321	MD5
1350	TFTP
1661	PPP
1989	PPP Link Quality Monitoring
1990	PPP Multilink Protocol
1994	PPP CHAP
2474	Differentiated Services
2615	PPP over SONET/SDH
2698	Two Rate Three Color Marker
draft-ietf-bfd-base-03	BFD

General IPv4 Protocols

791	IPv4
792	ICMP
826	ARP
1027	Proxy ARP
1042	Ethernet Transmission
1191	Path MTU Discovery
1305	NTPv3
1519	CIDR
1542	BOOTP (relay)
1812	Routers
2131	DHCP (relay)
2338	VRRP
3021	31-bit Prefixes

General IPv6 Protocols

1981	Path MTU Discovery (partial)
2460	IPv6
2461	Neighbor Discovery (partial)
2462	Stateless Address Autoconfiguration (partial)
2463	ICMPv6
2464	Ethernet Transmission
2675	Jumbograms
3587	Global Unicast Address Format
4291	Addressing

RIP

1058	RIPv1
2453	RIPv2

OSPF

2154	MD5
1587	NSSA
2328	OSPFv2

2370	Opaque LSA
2740	OSPFv3
3623	Graceful Restart
4222	Prioritization and Congestion Avoidance

IS-IS

1142	IS-IS
1195	IPv4 Routing
2763	Dynamic Hostname
2966	Domain-wide Prefixes
3373	Three-way Handshake
3567	MD5
3784	Wide Metrics
draft-ietf-isis-igp-p2p-over-lan-06	Point-to-point Operation
draft-ietf-isis-ipv6-06	IPv6 Routing
draft-kaplan-isis-ext-eth-02	Extended Frame Size

BGP

1997	Communities
2385	MD5
2439	Route Flap Damping
2545	Multiprotocol Extensions for IPv6
2796	Route Reflection
2842	Capabilities
2858	Multiprotocol Extensions
2918	Route Refresh
3065	Confederations
4360	Extended Communities
4893	4-byte ASN
draft-ietf-idr-bgp4-20	BGPv4
draft-ietf-idr-restart-06	Graceful Restart
draft-michaelson-4byte-as-representation-05	4-byte ASN Representation (partial)

Multicast

1112	IGMPv1
2236	IGMPv2
2710	MLDv1
3376	IGMPv3
3569	SSM
3618	MSDP
3810	MLDv2
3973	PIM-DM
4541	IGMP Snooping
draft-ietf-pim-sm-v2-new-05	PIM-SM

Network Management

1155	SMIv1
1156	Internet MIB
1157	SNMPv1
1212	Concise MIB Definitions
1215	SNMP Traps
1493	Bridges MIB
1724	RIPv2 MIB
1850	OSPFv2 MIB
1901	Community-based SNMPv2
2011	IP MIB
2012	TCP MIB
2013	UDP MIB
2024	DLSw MIB
2096	IP Forwarding Table MIB
2558	SONET/SDH MIB
2570	SNMPv3
2571	Mangement Frameworks
2572	Message Processing and Dispatching

2574	SNMPv3 USM
2575	SNMPv3 VACM
2576	Coexistence between SNMPv1/v2/v3
2578	SMIv2
2579	Textual Conventions for SMIv2
2580	Conformance Statements for SMIv2
2618	RADIUS Authentication MIB
2665	Ethernet-like Interfaces MIB
2674	Extended Bridge MIB
2787	VRRP MIB
2819	RMON MIB (groups 1, 2, 3, 9)
2863	Interfaces MIB
2865	RADIUS
3176	sFlow
3273	RMON High Capacity MIB
3416	SNMPv2
3418	SNMP MIB
3434	RMON High Capacity Alarm MIB
3580	802.1X with RADIUS
5060	PIM MIB
ANSI/TIA-1057	LLDP MED MIB
draft-grant-tacacs-02	TACACS+
draft-ietf-idr-bgp4-mib-06	BGP MIBv1
draft-ietf-isis-wg-mib-16	IS-IS MIB
IEEE 802.1AB	LLDP MIB
IEEE 802.1AB	LLDP DOT1 MIB
IEEE 802.1AB	LLDP DOT3 MIB
ruzin-mstp-mib-02	MSTP MIB (traps)
FORCE10-BGP4-V2-MIB	
FORCE10-FIB-MIB	
FORCE10-CS-CHASSIS-MIB	
FORCE10-IF-EXTENSION-MIB	
FORCE10-LINKAGG-MIB	
FORCE10-CHASSIS-MIB	
FORCE10-COPY-CONFIG-MIB	
FORCE10-MON-MIB	
FORCE10-PRODUCTS-MIB	
FORCE10-SS-CHASSIS-MIB	
FORCE10-SMI	
FORCE10-SYSTEM-COMPONENT-MIB	
FORCE10-TC-MIB	
FORCE10-TRAP-ALARM-MIB	

Management Features

Industry-standard CLI
XML configuration and command output
Telnet, SSHv1/v2
TFTP, FTP, scp
NTPv3
SNMPv1/v2/v3
Syslog
sFlow traffic accounting
RADIUS/TACACS+ authentication
RMON (groups 1, 2, 3, 9)
Port mirroring
HP OpenView support

Feature capabilities vary between the E-Series, C-Series and S-Series due to hardware differences. Consult the data sheets and product manuals for specific details on supported software features for each platform.

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